

Public debt and income inequality in times of austerity: Dynamic panel evidence

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ABSTRACT

This paper examines the relationship between public debt levels and income inequality during periods of fiscal consolidation (austerity). Specifically, it investigates two key questions: (a) whether high public debt during fiscal adjustments exacerbates income inequality, and (b) whether the composition of these adjustments influences the debt–inequality link. To address these issues, we apply a panel threshold methodology using annual data from 16 OECD countries over the period 1980–2019. Our findings reveal that public debt significantly affects income inequality, with the impact intensifying during fiscal adjustments, particularly at moderate debt thresholds (30–60%). Furthermore, when comparing the effects of tax-based versus spending-based adjustments, the evidence shows that tax-based consolidations tend to produce more persistent negative effects on income inequality.

KEYWORDS: Austerity, dynamic threshold model, income inequality, public debt

JEL CLASSIFICATION: E62, H2, H5, H6

1. Introduction

It is well established that Keynes wrote the *General Theory* during the Great Depression of the 1930s, a period characterized by high unemployment, declining wages and prices, and inadequate demand. The 2008 financial crisis bears many similarities to the Great Depression, with both periods marked by sharp declines in economic activity, stagnant economies, and diminished expectations.

In the 1930s, and again after 2007–2008, many governments adopted austerity policies in an attempt to revive economic growth. However, de Carvalho (2018) argues that austerity should not be conflated with fiscal discipline. Austerity policies, which aim to balance the budget and reduce public debt during recessions or depressions, lack robust empirical support for the idea that fiscal contractions can be expansionary. While some suggest that austerity might stimulate private spending, historical evidence shows that such measures are generally ineffective, especially in times of recession (King and Watson, 2012).

Public debt, in this context, plays a vital role in economic development by fostering growth and improving welfare. While public debt has risen steadily in recent

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decades, the global financial crisis and the COVID-19 pandemic have pushed debt levels to unprecedented heights, driven by policy responses to the pandemic and the resulting economic downturn. In 2020, global debt surged by 29% of GDP, reaching 262% of global GDP—the largest single-year increase in 50 years. Government debt in advanced economies reached record highs of 120% of GDP (Kose et al., 2022).

Options for reducing debt ratios include focusing on nominal GDP growth that outpaces interest rates. While this approach can lower debt levels, it may not reduce the actual debt stock. Alternatively, fiscal adjustment programs, such as austerity, can target debt reduction directly. Although austerity tends to be contractionary in the short term, as shown in a broad body of literature (Alesina et al., 2019; Alexiou & Nellis, 2016; Guajardo et al., 2011; Jordà & Taylor, 2016), its proponents argue that it is a preferable option to the long-term costs of excessive debt (Okeke et al., 2021).

Although research (e.g. Alesina et al., 2019; Furceri et al., 2022) has challenged the ‘expansionary austerity hypothesis’ that gained traction after the 2007–2008 financial crisis, the long-term benefits of lower public debt cannot be entirely dismissed. However, maintaining debt sustainability, particularly after the pandemic, is complicated by the lingering effects of COVID-19, especially on low-income groups (Furceri et al., 2022). Inequality tends to increase during fiscal adjustments, as highlighted by the inequality literature (Agnello & Sousa, 2011, 2014; Ball et al., 2013; Heimberger, 2020; Mulas-Granados, 2005), which shows that fiscal adjustments exacerbate distributional disparities.

As policymakers explore various options, it is essential to consider whether high public indebtedness exacerbates inequality during fiscal adjustment periods. While there is abundant evidence that factors such as the composition, size, duration, and pace of fiscal adjustments influence distributional outcomes, the role of public indebtedness remains underexplored. Klein and Winkler (2019) examine the distributional effects of austerity during periods of private debt overhang and find that inequality increases significantly when firms and households are heavily indebted. Additionally, they observe that inequality worsens more during times of low public debt compared to periods of high public debt overhang.

Proponents of the post-Keynesian tradition argue that austerity measures, such as cuts to government spending and tax hikes, can harm the economy, particularly during downturns, by stifling aggregate demand and potentially leading to recession or depression. Lavoie (2014) asserts that government spending is crucial for stabilizing the economy in times of instability, advocating for increased government spending during recessions to boost demand and create jobs.

Given the conflicting evidence regarding the impact of public debt on income distribution, we estimate dynamic panel threshold models using data from 16 OECD countries between 1980 and 2019. Our analysis explores: a) the extent to which different public debt thresholds influence distributional outcomes during fiscal adjustments (austerity), and b) the potential channels through which these distributional effects occur, focusing on the impact of tax-based versus spending-based adjustments on inequality.

The remainder of the study is structured as follows: Section 2 reviews the relevant literature as well as sets the theoretical perspective upon which the hypothesis is developed. Section 3 outlines the econometric strategy employed whilst Section 4 presents the empirical results and discusses them in relation to the existing literature. Lastly, Section 5 offers some concluding remarks.

2. Brief literature review

Public debt relative to GDP has steadily increased, with concerns growing after the global financial crisis. Cecchetti et al. (2011) argue that economic growth is essential for debt sustainability, as rising GDP generates necessary government revenues. Traditional macroeconomic theories link debt to tax smoothing and safe assets, but political economy theories cite demographic shifts and political polarisation (Yared, 2019).

The effects of public debt depend on its use and economic conditions. While it can support growth, excessive debt may crowd out investment, increase borrowing costs, and constrain fiscal space (Aiyagari & McGrattan, 1998; Gaspar et al., 2019; Kose et al., 2020). High interest rates suppress private investment, while rising debt-servicing costs reduce public spending on infrastructure and welfare. Thus, the key debate revolves around determining optimal debt levels and their economic impact (Cecchetti et al., 2011; Yared, 2019). Reinhart and Rogoff (2010) claimed debt above 90% of GDP hampers growth, fuelling support for austerity. However, later studies questioned this threshold and found a more complex debt–growth relationship (Cecchetti et al., 2011; Herndon et al., 2014).

The link between debt and inequality remains debated. Bartak et al. (2022) found short-term inequality rises with debt due to fiscal adjustments, while Furceri et al. (2022) showed pandemics lower GDP and increase inequality, with fiscal balances deteriorating by 2.5 percentage points. They, like Herndon et al. (2014), stress that fiscal space—rather than debt levels alone—determines crisis management capacity (Chamon & Ostry, 2021; Ghosh et al., 2013; Ostry et al., 2015).

Austerity policies have been widely criticised for worsening inequality as spending cuts raise unemployment and lower wages, disproportionately harming low-income groups (Agnello & Sousa, 2011, 2014; Ball et al. 2013; Brinca et al., 2021; Ciminelli et al., 2019; Woo et al., 2013). Revenue-based measures, such as tax hikes, also reduce disposable income and contribute to inequality (Bova et al., 2018; Ciminelli et al., 2019). Reductions in social spending weaken public employment, particularly affecting unskilled workers (International Monetary Fund, 2014).

Keynesian and post-Keynesian scholars argue that austerity suppresses demand, worsening downturns (Carvalho, 2018; Steindl, 1985). Post-Keynesians view debt as a stabilising tool, not a future burden (Alexiou, 2001, 2011; Alexiou & Pitelis 2003), while Palley (2012) links inequality to stagnation, noting austerity-induced job losses harm low-income households. Studies confirm that fiscal adjustments exacerbate inequality, increasing wealth concentration among the top ten percent (Kinda et al., 2018; Loungani, 2013; Ray, 2021).

2.1. Theories, transmission channels and hypothesis development

Fiscal policy plays a crucial role in shaping income distribution, particularly in the context of public debt levels and fiscal consolidation. In this context, various theoretical frameworks highlight how fiscal measures, particularly austerity, can either mitigate or worsen inequality depending on their design.

In particular, the fiscal policy and *redistribution theory* examines how austerity policies, such as tax increases and spending cuts, impact income distribution (Ball et al., 2013). Spending cuts, especially in social welfare, disproportionately harm low-income groups,

whereas well-targeted tax reforms can yield more progressive outcomes (Alesina & Perotti, 1996). The *debt overhang hypothesis* suggests that high public debt restricts fiscal options, often forcing aggressive consolidation measures that primarily impact lower-income households through reduced public services (Krugman, 1988; Woo et al., 2013) whilst the *structural inequality framework* situates fiscal policy within broader economic conditions, arguing that high debt levels and borrowing costs drive regressive fiscal adjustments (Ostry et al., 2014; Stiglitz, 2012).

Several mechanisms explain the link between public debt, fiscal consolidation, and inequality:

Composition of Fiscal Consolidation: High-debt countries tend to implement spending cuts rather than tax increases, disproportionately affecting lower-income households (Alesina et al., 2002). In contrast, low-debt countries can adopt tax-based consolidations with more progressive outcomes.

Labour Market Effects: Fiscal consolidation often leads to job losses and wage stagnation, with greater impacts in high-debt economies where fiscal multipliers are higher (Blanchard & Leigh, 2013).

Interest Rates and Inflation: High-debt economies face higher borrowing costs, crowding out private investment and slowing growth, disproportionately harming low-income groups (Alexiou, 2011). Inflation further affects real incomes across income groups, exacerbating disparities.

Political Economy Constraints: High debt increases external pressure from creditors, limiting governments' ability to implement redistributive policies and often resulting in regressive austerity measures (Rodrik, 1998).

Social Cohesion and Institutional Capacity: Austerity in high-debt contexts weakens social cohesion and reduces collective action capacity, worsening inequality, while lower-debt environments allow for fairer fiscal policies (Atkinson, 2015).

On the empirical front many studies confirm that spending-based austerity disproportionately increases inequality, particularly in advanced economies (Alesina et al., 2002; Ball et al., 2013; Woo et al., 2013). Countries with high debt levels are more likely to impose severe spending cuts, further exacerbating disparities.

Although extensive research has explored the effects of fiscal adjustment policies on debt, economic growth, and inequality, the interaction between different levels of public debt and income inequality through fiscal pathways remains insufficiently addressed. This research gap prompts the formulation of the following hypothesis:

H1: Different public debt levels have a significant impact on income inequality during periods of fiscal consolidation.

This hypothesis is tested by examining debt thresholds alongside fiscal adjustment size and type (spending or tax) to identify adjustments that exacerbate inequality. This is crucial for policymakers, who must consider the impact of austerity, particularly in high-debt countries with existing inequalities.

3. Econometric strategy

We utilize panel threshold and panel quantile methodologies (Seo & Shin, 2016). Threshold modelling effectively identifies unknown parameters and captures structural breaks in variable relationships (Wang, 2015).

3.1. Data

This study uses annual time series data from 1980 to 2019 for 16 OECD countries, selected based on fiscal adjustment data availability under the narrative methodology. These countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Portugal, Spain, Sweden, the UK, and the US. The dataset captures fiscal adjustments post-Great Recession and income inequality trends up to 2019 (Chancel et al., 2022). Post-2019 inequality indicators are excluded to avoid biases from COVID-19 and related expansionary fiscal policies.

3.2. Income inequality data

The Gini coefficient for disposable income, labour income share, and income share ratios are used as inequality proxies. While widely used, the Gini coefficient however is criticised for downplaying shifts at distribution extremes (Cobham & Sumner, 2013). To address this, alternative measures such as top income shares (Top 1 and Top 10) are included, following previous literature (Furceri et al., 2015; Kumhof & Ranciere, 2010; Woo et al., 2013; Wood, 2020). Additional indicators, including the Bottom 40, Palma ratio, labour share, and total income share, provide a more comprehensive view and ensure robustness. Tables 1A and 2A in the appendix summarise sources, definitions, and statistics.

3.3. Fiscal adjustment data

Several studies, including those by Guajardo et al. (2011), Holden and Midthjell (2013), International Monetary Fund (2014), Jordà and Taylor (2016), Castro (2018), and Ciminelli et al. (2019) have highlighted the limitations of using the Cyclically Adjusted Primary Balance (CAPB) to identify fiscal adjustment episodes. The CAPB method is often criticized due to issues related to measurement errors and reverse causality, which can distort macroeconomic estimates, particularly in the short run, leading to a bias in favor of expansionary output effects from fiscal consolidation programs.

In contrast to the CAPB approach, Devries et al. (2011) employed the narrative methodology, originally developed by Romer and Romer (2010), to map out episodes of fiscal adjustment based on historical narrative sources. Their work culminated in the construction of a database documenting 173 fiscal adjustment episodes across 17 OECD countries over a 32-year period (1978–2009). Alesina et al. (2015) extended this narrative-based approach by using the same methodology and sources to update the dataset to include the fiscal adjustments undertaken by countries in the aftermath of the global financial crisis, covering the period from 1978 to 2014.

In this study, we utilize fiscal adjustment data from the Alesina et al. (2015) and Heimberger (2020) datasets, as they encompass the critical post-Great Recession adjustment period. Across the 16 OECD countries in our panel, 227 fiscal adjustment episodes are identified. The size of these adjustments, scaled relative to GDP, ranges from -0.309% to 9.748% . This comprehensive dataset offers a robust basis for

analyzing the long-term impacts of fiscal consolidation on macroeconomic performance in the aftermath of major economic downturns. An overview of the adjustment dataset is reported in Table 2B in the Appendix.

3.4. Debt data

Data series for debt to GDP ratio was obtained from the World Economic Outlook database of the IMF. Missing series were observed for some countries for the early period¹ and so interpolation had to be relied on. Extremely large debt ratios, i.e. in excess of 120% of GDP can be observed for Ireland, Italy, Portugal, Belgium and Japan with size ranging between 120.04% and 236.14% of GDP. On the other hand, the smallest country wise *average* debt ratio for the period is recorded for Australia at 23.47% of GDP.

Countries are further categorised into two—relative to the size of the debt ratios for the respective countries. The extant literature as seen in Reinhart and Rogoff (2010), Herndon et al. (2014)²—categorise debt ratios into groups of: 0–30%, 30–60%, 60–90%, 90–120% and 120% and above. Therefore, to enable comparability with the extant literature and for the purpose of this analysis, debt ratios in excess of 60% of GDP (i.e. the median category of 60–90%) are grouped as large while ratios below this are considered as small to medium (otherwise referred to as ‘low debt’ countries in the ensuing analysis). An overview of the debt ratio series for the select panel of 16 countries as well as the respective debt category is reported in Table 2C in Appendix.

3.5. Methodologies considered

The empirical methodologies considered in estimating the baseline panel regression are: (i) the panel threshold model and (ii) the quantile panel regression model. Additionally, the fixed effects (FE) model with Driscoll–Kraay standard errors and an ordinary least square (OLS) model with cross section SUR are employed as robustness checks.

The panel threshold regression model as extended by Seo and Shin (2016) and the quantile panel regression model incorporate first difference transformations. Seo and Shin (2016) generalised model with FD-GMM estimators is seen below:

$$Y_{it} = (1, X'_{it}) \beta_1 1\{q_{it} \leq Y\} + (1, X'_{it}) \beta_2 + 1\{q_{it} > Y\} + e_{it} \quad (1)$$

where $i=1, \dots, n$ and represents the different cross-sections of the data; $t=1, \dots, T$ represents the time dimension of the data; Y_{it} is the dependent variable and a measure of income inequality for country i in year t ; X_{it} is a $k \times 1$ vector of time-varying

¹Australia 80–88; Austria 80–87; Denmark 80–91; Germany 80–90; Ireland 80–94; Italy 80–87; Portugal 80–89; Sweden 80–92; USA 80–00.

²While Reinhart and Rogoff (2010) end their category at 90% and above, Herndon et al. (2014) further define and extend it: 90–120% and 120% and above.

regressors and includes the lagged dependent variable, and key variables such as debt, taxes, spending, fiscal adjustment size, the respective interaction term as well as a set of control variables; $1\{q_{it} \leq Y\}$ is an indicator function that takes the value of one when the event inside occurs, otherwise zero; q_{it} is the threshold variable; Y the threshold or transition parameter that divides the equation into 2 regimes with associated coefficients β_1 and β_2 for the respective regimes; and e_{it} is the error component which comprises the individual country fixed effect μ_{it} and the idiosyncratic disturbance or error term.

Equation (1) can be re-specified to represent the 2 regimes:

$$Y_{it} = X_{it}(q_{it}, Y)\beta + e_{it} \quad (2)$$

where $X_{it}(q_{it}, Y) = X_{it} 1(q_{it} \leq Y)$

$$X_{it} 1(q_{it} > Y)$$

with $1(q_{it} \leq Y)$ specifying the lower regime and $1(q_{it} > Y)$ the upper regime.

The individual time-invariant characteristics (μ_{it}) inherent in equation one are removed *via* first difference transformation of the model as follows:

$$\Delta Y_{it} = \beta \Delta X_{it} + \partial X_{it} 1_{it}(Y) + \Delta e_{it} \quad (3)$$

To eliminate sources of bias and inconsistency that could arise due to correlation between the transformed regressors and the error term, GMM estimation is also implemented and instrumental variables are used. The instrument matrix was constructed by using the lagged levels of the endogenous explanatory variables as proposed by Arellano and Bond (1991) and Blundell and Bond (1998).

We also perform a Sargan specification tests to ensure the validity of the instruments and the model and the Arellano–Bond Test for serial correlation. To address concerns about instrument proliferation and potential overfitting in the GMM framework, we implement the collapsing instrument approach as suggested by Windmeijer (2005). Both AR(2) and Sargan tests are presented in the respective tables where the results are reported.

Since both the fiscal adjustment component and debt are important in determining the distributional impact, it is therefore essential to incorporate into the model the ‘interacted’ dynamics of these variables. Consequently, the regressors in X_{it} also include an interaction term. Going further, by specifically estimating a model which distinctly and jointly incorporates the interaction of debt and the adjustment type (spend and tax), the impact of the type of adjustment can be assessed at determined debt thresholds.

Before estimating the baseline panel regression, standard diagnostic tests (stationarity, heteroskedasticity, correlation, and cross-sectional dependency) were conducted. Cross-sectional dependency was detected in some panels, so estimation used generalised least squares (GLS) weights and seemingly unrelated regression (SUR). To mitigate multicollinearity in models with interaction terms, variables were centred by subtracting their mean, improving coefficient interpretability (Aiken et al., 1991). For brevity, diagnostic test results are not presented but are available upon request.

4. Results

Our data shows that most fiscal adjustments are multi-year events involving both tax hikes and spending cuts. To differentiate their distributional effects, we follow the literature (Ball et al., 2013; Furceri et al., 2022; Guajardo et al., 2011) and classify spending-based adjustments as those where spending cuts exceed tax hikes, and tax-based adjustments vice versa. A summary of the inequality indicator results for the panel threshold model is as follows:

4.1. Gini coefficient

The estimated debt threshold is 60.74% of GDP, dividing the model into lower and upper regimes. Below this threshold, adjustments show a negative relationship with inequality, while above it, inequality increases. Tax-based adjustments, with a threshold at 64.47% of GDP, exacerbate inequality in the lower regime, suggesting significant adverse distributional effects. These findings align with Keynesian effects, austerity literature (Alesina et al., 2015, 2018, 2019; Bertola & Drazen, 1993; Guajardo et al., 2011; IMF, 2010; Mulas-Granados, 2005; Paulus et al., 2017), and inequality literature. Tax-based adjustments, particularly indirect taxes like VAT (Bova et al., 2018), tend to worsen inequality, while direct taxes may also increase inequality through substitution effects (Ciminelli et al., 2019).

4.2. Labour income share

Table 1 shows that inequality increases through both spending and tax adjustments. At lower debt thresholds (38.33% and 36.46% of GDP for debt-spend and debt-tax, respectively), inequality rises for both adjustment types. Alesina et al. (2019) find that combining spending and tax adjustments reduces debt faster at low initial debt levels. However, even at moderate debt levels, tax-based adjustments tend to have more adverse distributional effects compared to spending-based measures.

4.3. Ratios

At the 37.08% GDP debt threshold, estimates for the Top1 show that inequality decreases in the lower regime for the debt-tax variable and increases in the upper regime (see Table 1). For the debt-spend variable, inequality decreases below 53.27% of GDP but increases in the upper regime. Although these results apply to different threshold regimes, the debt ratios are still considered medium. Thus, while both tax and spending adjustments have adverse effects on inequality at medium debt thresholds, tax instruments appear to have a larger impact.

For the Top10, estimates in Table 1 show that inequality decreases below the 37.70% GDP debt threshold, but increases above it. For the BOT40, the debt-tax variable indicates income share gains below the 66.34% threshold, reducing inequality, while above this, income share loss occurs, worsening inequality. For the BOT50, inequality is influenced by both spending and tax at thresholds of 57% and 42.68%, with increased inequality due to income share loss for spending instruments in the lower regime and tax instruments in the upper regime.

Table 1. Dynamic threshold panel regression.

Gini			
Debt-Adj (Debt*Adjustment Size) Model		Debt-Tax (Debt*Tax) Model	
Regime 1: Debt $\leq 60.74\%^{***}$		Regime 1: Debt $\leq 60.74\%^{***}$	
Variable	Coefficient (SE)	Variable	Coefficient (SE)
Gini(t-1)	-0.241(0.367)	Gini(t-1)	-0.888(0.01)***
Debt	0.0004(0.000001)**	Debt	0.005(0.001)***
Adj	-0.005(0.001)***	Tax	-0.008(0.003)**
Debt-Adj	-0.003(0.001)**	Debt-Tax	0.001(0.0001)***
Inflation	-0.002(0.0001)**	Inflation	-0.001(0.021)
Unemployment	0.002(0.0001)***	Unemployment	0.001(0.0001)***
GDPG	0.002(0.004)	GDPG	0.001(0.06)
Stock	0.0001(0.002)	Stock	0.001(0.021)
No. of Instruments	15	No. of Instruments	16
AR(2) <i>p</i> value	0.306		0.121
Sargan <i>p</i> value	0.283		0.782
Labour Income Share (LIS)		Labour Income Share (LIS)	
Debt-Spend (Debt*Spend) Model		Debt-Tax (Debt*Tax) Model	
Regime 1: Debt $\leq 38.33\%^{***}$		Regime 1: Debt $\leq 36.46\%^{***}$	
Variable	Coefficient (SE)	Variable	Coefficient (SE)
LIS(t-1)	0.902(0.01)***	LIS(t-1)	0.865(0.015)***
Debt	-0.003(0.001)**	Debt	-0.003(0.001)***
Spend	1.404(0.227)***	Tax	0.482(0.209)**
Debt-Spend	-0.010(0.002)***	Debt-Tax	-0.004(0.002)***
Inflation	0.016(0.038)	Inflation	0.022(0.013)
Unemployment	-0.025(0.0001)***	Unemployment	-0.012(0.0001)***
GDPG	-0.028(0.001)***	GDPG	-0.003(0.001)**
Stock	0.001(0.045)	Stock	0.001(0.034)
No. of Instruments	14	No. of Instruments	17
AR(2) <i>p</i> value	0.123		0.372
Sargan <i>p</i> value	0.872		0.829

(Continued)

Table 1. Continued.

TOP 1			TOP 1		
Debt-Tax (Debt*Spend) Model			Debt-Tax (Debt*Tax) Model		
Regime 1: Debt ≤ 53.27%***			Regime 1: Debt ≤ 39.57%***		
Variable	Coefficient (SE)	Regime 2: Debt ≥ 53.27%***	Variable	Coefficient (SE)	Regime 2: Debt ≥ 39.57%***
TOP1(t-1)	0.871(0.015)***	0.933(0.002)***	TOP1(t-1)	0.861(0.015)***	0.982(0.000)**
Debt	0.0006(0.000)***	0.001(0.000)**	Debt	0.0001(0.000)***	0.0001(0.000)**
Spend	0.002(0.001)**	0.221(1.92)	Tax	-0.002(0.010)**	0.0182(0.681)
Debt-Spend	-0.002(0.000)***	0.005(0.0001)***	Debt-Tax	-0.020(0.051)	0.001(0.0002)***
Inflation	-0.00001(0.021)	-0.0002(0.034)	Inflation	-0.0014(0.017)	-0.0023(0.078)
Unemployment	0.001(0.000)***	0.002(0.000)***	Unemployment	0.003(0.001)**	0.003(0.003)
GDPG	0.002(0.000)***	0.001(0.000)***	GDPG	0.002(0.000)***	0.001(0.000)***
Stock	0.0002(0.026)	0.0014(0.082)	Stock	0.0011(0.071)	0.0031(0.064)
No. of Instruments	13		No. of Instruments	15	
AR(2) <i>p</i> value	0.367			0.092	
Sargan <i>p</i> value	0.483			0.872	
TOP 10			BOT40		
Debt-Adj (Debt*Adjustment Size) Model			Debt-Tax Model		
Regime 1: Debt ≤ 37.70%***			Regime 1: Debt ≤ 63.34%***		
Variable	Coefficient (SE)	Regime 2: Debt ≥ 37.70%***	Variable	Coefficient (SE)	Regime 2: Debt ≥ 63.34%***
TOP10(t-1)	0.875(0.014)***	0.378(0.002)***	BOT40(t-1)	0.673(0.002)***	0.783(0.021)***
Debt	0.0007(0.000)***	0.0006(0.189)	Debt	0.073(0.673)	0.008(0.078)
Adj	-0.182(0.341)	0.392(0.782)	Tax	0.023(0.001)***	-0.037(0.191)
Debt-Adj	-0.031(0.0001)***	0.0001(0.001)**	Debt-Tax	0.013(0.001)***	-0.012(0.002)***
Inflation	0.001(0.031)	0.002(0.046)	Inflation	-0.015(0.002)**	-0.011(0.067)
Unemployment	0.001(0.000)***	0.002(0.001)**	Unemployment	0.002(0.034)	0.001(0.072)
GDPG	0.003(0.000)***	0.001(0.000)***	GDPG	0.002(0.000)***	0.001(0.000)***
Stock	0.0001(0.026)	0.0001(0.045)	Stock	0.002(0.001)**	0.001(0.026)
No. of Instruments	15		No. of Instruments	14	
AR(2) <i>p</i> value	0.312			0.102	
Sargan <i>p</i> value	0.472			0.176	

Table 1. Continued.

PALMA			
Debt-Spend (Debt*Spend) Model		Debt-Tax (Debt*Tax) Model	
Regime 1: Debt ≤ 38.11%***	Regime 2: Debt ≥ 38.11%***	Regime 1: Debt ≤ 51.11%***	Regime 2: Debt ≥ 51.11%***
Variable	Coefficient (SE)	Variable	Coefficient (SE)
PALMA(t-1)	0.946(0.001)***	PALMA(t-1)	0.947(0.001)***
Debt	-0.0001(0.000)***	Debt	-0.003(0.001)***
Spend	-0.020(0.006)***	Tax	-0.012(0.021)
Debt-Spend	0.0001(0.000)***	Debt-Tax	-0.031(0.002)**
Inflation	0.002(0.001)**	Inflation	0.001(0.0002)**
Unemployment	-0.001(0.026)	Unemployment	-0.001(0.038)
GDPG	-0.001(0.004)	GDPG	-0.001(0.0002)**
Stock	0.0001(0.025)	Stock	0.0001(0.018)
No. of Instruments	12	No. of Instruments	11
AR(2) p value	0.092		0.281
Sargan p value	0.129		0.672
BOT50			
Debt-Tax (Debt*Tax) Model		Debt-Spend (Debt*Spend) Model	
Regime 1: Debt ≤ 57 %***	Regime 2: Debt ≥ 57%***	Regime 1: Debt ≤ 42.68%***	Regime 2: Debt ≥ 42.68%***
Variable	Coefficient (SE)	Variable	Coefficient (SE)
BOT50(t-1)	-0.407 (0.000)***	BOT50(t-1)	0.734(0.053)***
Debt	0.007(0.012)***	Debt	0.065(0.667)
Tax	-0.021(0.001)***	Spend	0.013(0.001)***
Debt-Tax	0.0001(0.0001)***	Debt-Spend	0.001(0.0001)***
Inflation	-0.001(0.000)***	Inflation	-0.001(0.012)
Unemployment	0.004(0.023)	Unemployment	0.001(0.035)
GDPG	0.002(0.000)***	GDPG	0.002(0.000)***
Stock	0.002(0.021)	Stock	0.001(0.026)
No. of Instruments	14	No. of Instruments	12
AR(2) p value	0.483		0.293
Sargan p value	0.293		0.183

Notes: ***Significant at 1% level; ** 5% level; * 10% level; Debt-Adj = (Debt*Adjustment Size); Debt-Spend = (Debt*Spend); Debt-Tax = (Debt*Tax); interacts debt and; Debt-Adj = (Debt*Adjustment Size); Debt-Spend = (Debt*Spend); Debt-Tax = (Debt*Tax); AR(2) test the second order of serial correlation; Sargan tests the null hypothesis of appropriate set of instruments.

Regarding the Palma Ratio, inequality increases through both spend and tax channels. The debt-spend variable shows that below the 38.11% threshold, the Top10% gain income share, increasing inequality, while above this, income share loss reduces inequality. The debt-tax variable indicates income share loss for the top decile relative to the Bottom 40% at thresholds below and above 51.11% of GDP.

As far as the rest of the control variables are concerned, inflation across all models and regimes shows a consistently negative relationship with Gini, albeit with varying significance levels suggesting that inflation may exert a minor downward impact on inequality. Unemployment on the other hand, has a positive and significant effect in most regimes suggesting that unemployment exacerbates inequality whilst GDP growth is generally found to be insignificant in affecting inequality, with just a few instances of significance, but the relationship appears weak overall. Finally, the proxy for financialization is found to be largely insignificant, with negligible values across all regimes and models suggesting that there is no substantive impact on inequality.

4.4. Robustness

The model stratifies debt levels (Small, Medium, Large, Very Large, and Extremely Large) to identify how policies affect inequality based on fiscal starting points. For example, spending cuts may worsen inequality at higher debt levels where social safety nets are strained, while tax increases might have a stronger redistributive effect at lower debt levels with better compliance. The impact of adjustment size, spending, and taxes varies depending on a country's debt level. Small adjustments may positively affect inequality in low-debt countries but be ineffective or harmful in high-debt ones. Similarly, spending and tax policies differ depending on fiscal space at each debt level.

To examine this, we use a Driscoll–Kraay fixed effects model to address cross-sectional dependence and heteroskedasticity in panel data (Driscoll & Kraay, 1998). The model interacts dummy variables with fiscal adjustment size and type (spend or tax) to identify which adjustments drive inequality.

The control variables used in the estimation—public debt, government spending, fiscal adjustment, taxes, inflation, unemployment, GDP growth, and stock-to-GDP ratio—are commonly used in inequality studies as they capture critical aspects of macroeconomic and structural dynamics that influence income distribution (Alesina & Ardagna, 2010; Bivens & Banerjee, 2022).

Controlling for government spending allows the model to identify whether fiscal policies contribute to reducing or exacerbating inequality whilst taxes allow the analysis to capture the redistributive effects of fiscal policy and examine how tax structures interact with other economic variables to influence inequality. Furthermore, fiscal adjustment captures its role in shaping the distributional effects of fiscal policies, particularly during economic crises or periods of austerity.

Inflation affects income inequality through its impact on real incomes, savings, and wealth distribution. Controlling therefore for inflation ensures that observed changes in inequality are not confounded by price level changes that may favor or harm different income groups. Furthermore, unemployment directly impacts labor

income distribution hence capturing the role of labor market dynamics in shaping inequality, ensuring that observed effects are not driven by cyclical labor market trends. Economic growth can influence inequality in several ways such as *Trickle-Down Effects* where growth may reduce inequality if it creates jobs and lifts incomes across the board; Conversely, growth may exacerbate inequality if its benefits are concentrated among high-income groups, such as investors or top executives. Controlling for GDP growth ensures that the analysis isolates inequality effects independent of overall economic performance, highlighting whether growth is inclusive or exclusive. Finally, the stock-to-GDP ratio reflects the extent of financial market activity relative to the real economy, serving as a proxy for financialization. Increased financialization often benefits higher-income groups disproportionately, as they are more likely to own financial assets whilst diverting resources from productive investments (e.g. wages, manufacturing) to speculative activities, widening the income gap (Huber et al., 2022).

Table 2 provides a detailed summary of the Driscoll–Kraay fixed effects regression analysis, assessing the effects of various economic variables on indicators of inequality such as the Gini coefficient, labor income share, top income shares, and the Palma ratio. More specifically, high persistence across most measures is observed. This indicates that inequality levels are heavily influenced by past inequality levels. Once inequality rises, it tends to remain high unless actively addressed through policy interventions. The direct effect of debt appears to have a small but significant negative effect on inequality as measured by the Gini coefficient and the Palma ratio. This suggests that higher debt may sometimes be associated with slightly lower inequality, potentially through redistribution mechanisms such as public spending financed by debt.

The interaction coefficients of the *Debt-Adj* variable are found to indicate a negative and significant effect on inequality at various levels suggesting that larger adjustments seem to reduce inequality more significantly whilst the *Debt-Spend* coefficients are found to be negative and significant in multiple cases in some models suggesting that spending in high-debt scenarios reduces inequality. Moreover, the *Debt-Tax* negative coefficients appear in some models to be significant hence, indicating taxation in high-debt scenarios could reduce inequality. The individual dummies suggest that coefficients for small and medium debt dummies are not consistently significant, suggesting minimal impact of small to medium debt levels on inequality or income shares. The medium to large debt levels appear to have the most robust and consistent effects on inequality, particularly when combined with spending adjustments whilst extremely large debt levels may have adverse implications for inequality, requiring careful fiscal policy intervention.

The interactions of the stratified variables with spending and taxation suggest that the spending-related interactions (e.g. ELDDSPEND, MDDSPEND) tend to show significant effects, often reducing inequality at higher levels of debt whereas tax-related interactions are more inconsistent, with some coefficients suggesting redistributive effects (e.g. SDDTAX reduces inequality) while others show no impact. Unlike Gini or Palma, the Labour Income Share does not show strong persistence over time, suggesting it may respond more readily to short-term policies.

As far as the macroeconomic variables are concerned, inflation exhibits a small but significant negative effect on the Gini coefficient and labor income share hence

Table 2. Driscoll–Kraay fixed effects.

GINI				GINI				LABOUR INCOME SHARE (LIS)				LABOUR INCOME SHARE (LIS)			
DEBT-ADJ (DEBT*ADJUSTMENT SIZE)				DEBT-TAX (DEBT*TAX)				DEBT-SPEND (DEBT*SPEND)				DEBT-TAX (DEBT*TAX)			
Variable	Coef.	Std. Error		Variable	Coef.	Std. Error		Variable	Coef.	Std. Error		Variable	Coef.	Std. Error	
Gini(t-1)	0.782***	0.023		Gini(t-1)	0.872***	0.000		LIS(t-1)	0.025	0.173	LIS(t-1)	0.182	0.182	0.326	
Debt	-0.0001*	0.000		Debt	-0.0002	0.001		Debt	0.001	0.074	Debt	-0.013	0.061	0.061	
Adj	-0.002	0.026		Tax	-0.004	0.004		Spend	0.002***	0.000	Tax	0.012	0.092	0.092	
Debt-Adj	-0.002**	0.001		Debt-Tax	-0.001	0.021		Debt-Spend	-0.001***	0.000	Debt-Tax	-0.021**	0.011	0.011	
SDD	0.003	0.024		SDD	-0.0001	0.036		SDD	0.003	0.372	SDD	0.002	0.237	0.237	
MDD	-0.002	0.005		MDD	-0.002	0.005		MDD	-0.012***	0.000	MDD	-0.001	0.173	0.173	
LDD	0.001***	0.000		LDD	0.001***	0.000		LDD	-0.006	0.046	LDD	-0.018	0.019	0.019	
VLDD	0.004	0.031		VLDD	0.003	0.067		VLDD	-0.001***	0.000	VLDD	-0.013	0.832	0.832	
ELDD	0.002**	0.001		ELDD	0.002***	0.000		ELDD	-0.004***	0.000	ELDD	-0.041	0.451	0.451	
SDDAD	0.0001	0.0008		SDDTAX	-0.001	0.006		SDDSPEND	0.152	0.036	SDDTAX	0.123***	0.000	0.000	
MDDAD	-0.002	0.006		MDDTAX	-0.001	0.005		MDDSPEND	-0.127***	0.003	MDDTAX	-0.137	0.233	0.233	
LDDAD	-0.001***	0.000		LDDTAX	-0.003**	0.001		LDDSPEND	-0.116	0.171	LDDTAX	-0.026	0.381	0.381	
VLDDAD	0.0002	0.0003		VLDDTAX	0.002	0.021		VLDDSPEND	-0.103***	0.001	VLDDTAX	-0.271	0.372	0.372	
ELDDAD	0.001**	0.0001		ELDDTAX	0.001***	0.000		ELDDSPEND	-0.182***	0.002	ELDDTAX	-0.154	0.451	0.451	
Inflation	-0.001***	0.000		Inflation	-0.001***	0.000		Inflation	0.001	0.011	Inflation	0.021	0.071	0.071	
Unemployment	0.0002	0.002		Unemployment	0.0012	0.011		Unemployment	-0.126***	0.001	Unemployment	-0.082***	0.000	0.000	
GDPG	0.0001	0.003		GDPG	0.002	0.0031		GDPG	-0.061***	0.003	GDPG	-0.066***	0.001	0.001	
Stock	0.0001	0.002		Stock	0.0001	0.022		Stock	0.001	0.001	Stock	0.001	0.001	0.001	
C	0.029***	0.000		C	0.051***	0.000		C	1.872***	0.004	C	1.689***	0.026	0.026	

(Continued)

Table 2. Continued.

TOP 1			TOP 10			PALMA RATIO			PALMA RATIO		
DEBT-SPEND (DEBT*SPEND)			DEBT-SPEND (DEBT*SPEND)			DEBT-SPEND (DEBT*SPEND)			DEBT-TAX (DEBT*TAX)		
Variable	Coef.	Std. Error	Variable	Coef.	Std. Error	Variable	Coef.	Std. Error	Variable	Coef.	Std. Error
TOP1(t-1)	-0.178***	0.000	TOP10(t-1)	-0.152***	0.000	Palma(t-1)	0.622***	0.000	Palma(t-1)	0.452	0.711
Debt	-0.0002	0.012	Debt	-0.0001	0.0002	Debt	-0.002**	0.0001	Debt	-0.0002	0.003
Spend	0.021	0.061	Spend	-0.032	0.062	Spend	0.002	0.014	Tax	0.001	0.041
Debt-Spend	-0.003	0.051	Debt-Spend	-0.001	0.014	Debt-Spend	-0.002**	0.001	Debt-Tax	0.003	0.032
SDD	0.001	0.052	SDD	0.002	0.026	SDD	0.001	0.034	SDD	-0.002	0.045
MDD	0.001**	0.0005	MDD	0.003*	0.001	MDD	0.001	0.072	MDD	0.002**	0.001
LDD	0.0021	0.034	LDD	-0.002	0.003	LDD	-0.002	0.022	LDD	-0.001	0.047
VLDD	0.001	0.0026	VLDD	0.001	0.005	VLDD	0.001	0.073	VLDD	0.001	0.063
ELDD	0.001	0.007	ELDD	0.004	0.003	ELDD	0.001**	0.0005	ELDD	0.003**	0.001
SDDSPEND	0.001	0.031	SDDSPEND	0.001	0.002	SDDSPEND	0.001	0.016	SDDTAX	-0.001	0.061
MDDSPEND	0.002**	0.001	MDDSPEND	0.002*	0.001	MDDSPEND	0.001	0.027	MDDTAX	-0.005**	0.002
LDDSPEND	0.0002	0.002	LDDSPEND	-0.0002	0.001	LDDSPEND	-0.003	0.018	LDDTAX	-0.001	0.017
VLDSPEND	0.001	0.004	VLDSPEND	0.0001	0.003	VLDSPEND	0.004	0.027	VLDDTAX	0.002	0.032
ELDDSPEND	0.001	0.0008	ELDDSPEND	0.0002	0.002	ELDDSPEND	0.005**	0.002	ELDDTAX	0.006**	0.002
Inflation	-0.0002	0.004	Inflation	0.0001	0.012	Inflation	-0.0005*	0.0002	Inflation	0.0002**	0.0001
Unemployment	0.0002***	0.000	Unemployment	0.001***	0.000	Unemployment	-0.0001	0.004	Unemployment	-0.0003	0.002
GDPG	0.001***	0.000	GDPG	0.001***	0.000	GDPG	-0.001	0.002	GDPG	-0.0004	0.003
Stock	0.0001	0.021	Stock	0.0002	0.001	Stock	0.0001	0.003	Stock	0.0001	0.006
Cons.	-0.089***	0.000	Const.	-0.041***	0.000	C	0.072***	0.000	Const.	0.662***	0.000

(Continued)

Table 2. Continued.

Variable	TOP10/BOTTOM50			TOP10/BOTTOM50		
	DEBT*SPEND			DEBT*TAX		
	Coef.	Std. Error		Coef.	Std. Error	
TOP10BOT50(t-1)	0.192***	0.000		0.322***	0.001	
Debt	-0.002	0.012		-0.0002	0.021	
Spend	-0.001	0.015		0.015	0.053	
Debt*Spend	-0.001	0.071		-0.021	0.027	
SDD	-0.003	0.078		-0.002***	0.000	
MDD	-0.002	0.035		-0.031	0.072	
LDD	-0.012	0.017		-0.021	0.049	
VLDD	-0.001	0.078		-0.001**	0.000	
ELDD	0.021**	0.011		0.017***	0.000	
SDDSPEND	-0.013	0.061		-0.031***	0.000	
MDDSPEND	-0.017	0.026		-0.026	0.053	
LDDSPEND	-0.011	0.036		-0.061	0.082	
VLDDSPEND	-0.002	0.061		-0.093**	0.047	
ELDDSPEND	0.021**	0.011		0.027***	0.000	
Inflation	-0.015**	0.006		-0.023***	0.000	
Unemployment	0.002	0.035		0.003	0.071	
GDPG	0.009***	0.000		0.027***	0.000	
Stock	0.001	0.023		0.001	0.012	
Const.	1.561***	0.785		1.862***	0.000	

Note: ***Significant at 1% level; **5% level; * 10% level; SDDAD = (SmallDebtDummy*Adjustment Size); MDDAD = (MediumDebtDummy*Adjustment Size); LDDAD = (LargeDebtDummy*Adjustment Size); VLDDAD = (VeryLargeDebtDummy*Adjustment Size); ELDDAD = (ExtremelyLargeDebtDummy*Adjustment Size); SDDSPEND = (SmallDebtDummy*Spend); MDDSPEND = (MediumDebtDummy*Spend); LDDSPEND = (LargeDebtDummy*Spend); VLDDSPEND = (VeryLargeDebtDummy*Spend); ELDDSPEND = (ExtremelyLargeDebtDummy*Spend); SDDTAX = (SmallDebtDummy*Tax); MDDTAX = (MediumDebtDummy*Tax); LDDTAX = (LargeDebtDummy*Tax); VLDDTAX = (VeryLargeDebtDummy*Tax); ELDDTAX = (ExtremelyLargeDebtDummy*Tax).

suggesting that inflation can have a mild redistributive effect. This might be due to inflation eroding fixed incomes (e.g. top earners' financial assets) more than labor incomes. Higher unemployment consistently exacerbates inequality, while GDP growth shows mixed effects depending on the inequality indicator.

4.5. Discussion

Our findings indicate that: (i) threshold effects are significant for inequality at medium or higher debt ratios, (ii) inequality effects for the top decile and percentile are significant at low to medium debt ratios, while effects for the Gini, Labour Share, Palma, and Bottom 40 and 50 occur at large and extremely large debt ratios, (iii) inequality increases mainly through both spend and tax channels, with larger increases *via* the tax channel, (iv) inequality increases through the labour share channel are more significant and widespread across debt thresholds, and (v) the impact of debt-adjustment on inequality is stronger than the effects of public debt alone.

The empirical evidence indicates that the distinct debt variable significantly impacts income inequality, particularly for the Top 1 and labor share. This finding aligns with expectations, as government bondholders—often concentrated in financial markets and among the highest-income earners—receive interest payments on these bonds. These payments tend to exceed the taxes paid by these groups, thereby exacerbating income inequality (Anselmann & Krämer, 2016). However, the inequality effects stemming directly from the debt variable are less pronounced compared to those observed when the debt variable is interacted with fiscal adjustment instruments such as spending and taxation. This suggests that the debt-adjustment nexus plays a critical role in driving distributional outcomes, with larger inequality effects arising when debt is coupled with austerity measures.

The data further suggest that a mix of fiscal adjustment instruments—spending cuts and tax increases—negatively affects income distribution, as reflected in various inequality measures, including the labor share, Top 1, Bottom 40 and 50, and the Palma ratio. According to Chancel et al. (2022), mixed fiscal instruments tend to amplify adverse distributional consequences, disproportionately harming lower-income groups. Moreover, these mixed adjustment measures appear to be particularly significant at very high debt levels, implying that elevated debt may necessitate more stringent austerity policies.

Despite the widespread implementation of such measures, Ostry et al. (2014) argue that if a country maintains ample fiscal space, policies aimed at deliberately reducing debt may be 'normatively undesirable,' as the economic distortions caused by these policies likely outweigh any crisis-insurance benefits gained from lower debt levels (p. 1). This perspective is supported by Furceri et al. (2022), who emphasize that debt reduction policies should be approached cautiously, particularly when fiscal space allows for more flexible economic management.

Additional evidence suggests that the largest increases for inequality come from the labour share and are observed from medium (30–60%) to extreme debt threshold levels ($\geq 120\%$). Furthermore, non-linear effects are evident between the 0–30% and the 30–60% thresholds with the labour share contributing to a significant *decrease* in inequality at the 0–30% debt threshold as well as an *increase* in inequality at the 30–60% threshold *via* the spend and tax channels respectively. This

non-linearity is consistent with the findings by Holden and Midthjell (2013) that a non-linear relationship exists between these two debt categories albeit for public debt and growth.

Overall, the findings integrate fiscal policy, redistribution theory, the debt overhang hypothesis, and the structural inequality framework, revealing how fiscal adjustments at medium to high debt levels exacerbate inequality, particularly through taxation and labour share channels. The evidence reinforces the importance of equitable fiscal policies that avoid regressive austerity measures and account for structural inequalities, particularly when fiscal space allows for more balanced approaches.

5. Concluding remarks

Despite the literature indicating that factors like the business cycle, economic conditions, adjustment size, duration, and private debt dynamics influence distributional outcomes during fiscal adjustments, the role of public debt levels remains underexplored. This study addresses this gap by examining how public debt dynamics affect distributional outcomes during fiscal adjustments. Using a dynamic panel threshold methodology across 16 OECD countries over 40 years, the evidence (robust to various models) suggests that: (i) public debt levels impact income inequality, particularly during fiscal adjustments (austerity), (ii) adverse inequality effects typically emerge at medium to extreme debt thresholds, and (iii) tax-based instruments are more persistent in causing adverse outcomes than spending-based ones.

Our findings suggest that a universal debt threshold for inequality reduction is challenging to establish, as thresholds vary by transmission channel. While sustainable finances are important, lessons from post-2007/8 financial crisis consolidation exercises caution against one-size-fits-all approaches. A more prudent policy might involve a Keynesian strategy, balancing spending increases with tax hikes for the short to medium term (Taylor et al., 2012).

The interplay between fiscal policy, redistribution theory, the debt overhang hypothesis, and the structural inequality framework underscores a critical lesson: fiscal adjustments at medium to high debt levels, particularly those relying on regressive measures such as disproportionate taxation and reductions in labour share, exacerbate income inequality. This evidence presented in this study highlights the urgency of adopting equitable fiscal policies that prioritise fairness and social cohesion. By avoiding regressive austerity measures and addressing deep-seated structural inequalities, policymakers can craft strategies that not only ensure debt sustainability but also promote inclusive economic growth. When fiscal space permits, balanced approaches become not just possible, but essential for fostering long-term prosperity and equity.

A balanced approach, incorporating prudent spending increases and strategic tax hikes based on Keynesian principles, offers a more effective path for short to medium-term government spending, ensuring economic stability and growth. Given that our findings show tax-based adjustments exacerbate inequality, tax hikes should focus on progressive instruments, targeting specific groups (e.g. corporations) and widening the tax base, including short-term measures like one-off windfalls. Such increases could moderate inequality while funding expenditure.

Inequality is a structural issue rooted in capitalism, where income and wealth distribution reflects power dynamics between social groups. Those with more power can extract more from the economy. Policies to mitigate inequality may include progressive taxation, minimum wage laws, and social welfare programs, which can redistribute wealth, boost aggregate demand, and promote growth.

Finally, we acknowledge that outcomes may differ for developing economies, which face unique challenges related to high debt and financial stability. While beyond the scope of this study, future research should explore this area.

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Appendix

Table 1A. Definition of variables.

Variables	Definition	Source
GINI	The Gini coefficient measures the distribution of income in a population. It ranges between 0 and 1; where 0 denotes perfect equality and 1 perfect inequality	OECD
LABOUR SHARE	It is that part of national income which is allocated for labour compensation.	OECD
TOP1	Share of all income received by the 1% with the highest income in the population.	https://wid.world
TOP10	Share of all income received by the 10% with the highest income in the population.	https://wid.world
BOTTOM40	Share of all income received by the bottom 40% in the income distribution ladder.	https://wid.world
BOTTOM50	Share of all income received by the bottom 50% in the income distribution ladder.	https://wid.world
PALMA RATIO	Share of all income received by the 10% people with highest disposable income divided by the share of all income received by the 40% people with the lowest disposable income.	OECD
TOP10BOT50	This is the ratio of the top decile to the bottom 50 in the income distribution.	https://wid.world
INFLATION	Consumer price index.	oecd.org ; un.org ; imf.org
UNEMPLOYMENT	Unemployment rate.	OECD
TRADE	Trade refers to trade openness and captures the sum of total exports and imports as a percentage of GDP.	oecd.org ; worldbank.org ; imf.org
GDPG	Gross domestic product growth rate.	OECD
EPISODE DUMMY	Dummy variable which represents the fiscal adjustment episodes - with 1 corresponding to the start of an episode and 0 otherwise.	Agnello et al. (2013), Ball et al. (2013), Furceri et al. (2022), Heimberger (2020)
ADJUSTMENT SIZE	This is the budgetary impact of the fiscal adjustments scaled relative to GDP, i.e. the fiscal adjustment size measured as a percentage of GDP.	Alesina et al. (2002), Devries et al. (2011)
SPEND	Spend-based adjustments as a percentage of GDP.	Alesina et al. (2002), Devries et al. (2011)
TAX	Tax-based adjustments, as a percentage of GDP.	Alesina et al. (2002), Devries et al. (2011)
STOCK	Stock to GDP ratio.	Huber et al. (2022)
PUBLIC DEBT	Public Debt to GDP ratio	OECD

Table 2A. Descriptive statistics.

	Mean	Maximum	Minimum	Std. Dev.
ADJUSTMENT SIZE	0.56811	9.74799	−0.30894	1.183494
SPEND	0.23839	5.00848	−0.75000	0.659960
TAX	0.13596	5.22974	−0.75000	0.529173
DEBT	67.90231	236.139	−75.514	42.35493
INFLATION	3.449047	28.38	−4.48	3.77455
UNEMPLOYMENT	8.042225	26.09	1.46	3.999918
GDPG	2.284429	25.17625	−8.074447	2.414256
STOCK	53.95619	396.8041	−29.60648	67.7945
GINI	0.390219	0.56	0.26	0.069098
LABOUR SHARE	75.35078	97.65	50.83	6.022229
TOP1	0.090494	0.1933	0.0324	0.029767
TOP10	0.303382	0.4602	0.2076	0.05696
BOT40	0.169187	0.2565	0.0942	0.038272
BOT50	0.240187	0.3355	0.1282	0.049734
PALMA	1.289247	4.04	−1.56	0.753712
TOP10BOT50	6.901562	18	3	3.121634
TOTAL INCOME SHARE (log)	25.03614	28.71069	21.31436	1.413233
LARGE-VLGE-EXT LGE COUNTRIES	95.70406	236.139	23.193	42.88008
SMALL MED DEBT COUNTRIES	46.27872	108.8	−75.514	26.31389

Table 2B. Fiscal adjustment episodes: 16 OECD countries from 1980 to 2014.

Countries	Fiscal Adjustment Episodes
Australia	1985–88; 1994–99
Austria	1980–81; 84; 1996–97; 2001–02; 2011–14
Belgium	1982–87; 1990; 1992–94; 1996–97; 2010–14
Canada	1983–97; 2010–14
Denmark	1982–85; 1994–95; 2009–13
Finland	1992–97; 2010–14
France	1987–89; 1991–92; 1995–00; 2010–14
Germany	1982–84; 1991–95; 1997–00; 2003–07; 2011–13
Ireland	1982–88; 2008–14
Italy	1991–98; 2004–07; 2010–14
Japan	1980–83; 1997–98; 2003–07
Portugal	1983; 2000; 2002; 2005–07; 2010–14
Spain	1983–84; 1989–90; 1992–97; 2009–14
Sweden	1984; 1993–98; 1980–82; 1993–99; 2010–14
United Kingdom	1980–81; 1985–88; 1990–98; 2011–13
United States	

Source: Alesina et al. (2015) dataset available at www.igier.unibocconi.it/fiscalplans.

Table 2C. Public debt to GDP ratio categories.

Country	DEBT CATEGORY									
	0–30% (Small)		30–60% (Medium)		60–90% (Large)		90–120% (Very Large)		120% and Above (Extremely Large)	
	Debt size Category	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency	Ave Debt Ratio % GDP
Australia	80–92; 96–12	9.68–29.36; 30x	93–95; 13–19 46.80; 10x	80–85; 93–19	60.46–84.40; 33x	82–85; 98–06; 08–19	91.49–119.388; 25x	86–97	124.271–138.926; 12x	23.47
Austria	–	–	86–92 55.93–59.43; 7x	80–81; 07	–	–	–	–	–	67.72
Belgium	–	–	–	80–81; 07	76.80–89.69; 3x	82–85; 98–06; 08–19	91.49–119.388; 25x	86–97	124.271–138.926; 12x	110.82
Canada	–	–	80–83 44.59–57.21; 4x	84–92; 99–14; 17–19	60.21–88.97; 28x	93–98; 15–16	91.22–100.24; 8x	–	–	78.26
Denmark	80–88; 07	–75.51–27.35; 10x	89–91; 99–06; 08–19	31.20–56.76; 23x	60.28–78.63; 7x	–	–	–	–	30.76
Finland	80–91	10.89–21.89; 12x	92–14; 18–19	32.56–59.83; 25x	61.17–63.64; 3x	–	–	–	–	38.83
France	80–84	20.83–29.09; 5x	85–96; 00–01	30.70–59.99; 14x	60.26–87.84; 13x	44914.00	90.60–98.13; 8x	–	–	59.77
Germany	80–87	11.83–29.11; 8x	85–98; 00–02; 19	31.58–59.95; 15x	60.39–82.00; 17x	–	–	–	–	52.39
Ireland	44627.00	27.65–29.82; 5x	98–02; 08; 19	30.87–57.22; 7x	61.58–87.21; 10x	91–93; 11–12; 14	95.90–119.67; 6x	80–90; 13	120.04–208.86; 12x	93.62

(Continued)

Table 2C. Continued.

Debt Range, Frequency and Category (1980–2019)												
Country	0–30% (Small)			30–60% (Medium)			60–90% (Large)			90–120% (Very Large)		
	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency	Year Range	Debt Ratio Range% and Frequency
Italy	–	–	–	–	80–86	73.89 89.86; 7x	87–92; 95–11	92.53–119.69; 23x	93–94; 12–19	123.417–135.37; 10x	–	–
Japan	–	–	80–82	47.84–57.78; 3x	83–94	63.62–84.36; 12x	95–98	92.53–116.02; 4x	99–19	129.50–236.14; 21x	–	–
Portugal	80–81	23.19–26.90; 2x	82–89; 92–93; 97–01	30.60–58.72; 15x	90–91; 94–96; 02–09	60.04–87.80; 13x	10–11; 19	100.21–116.61; 3x	44913.00	121.48–132.94; 7x	–	–
Spain	80–82	16.58–25.14; 3x	83–94; 00–09	30.38–58.68; 22x	95–99; 10–12	63.38–86.31; 8x	13–19	95.54–100.70; 7x	–	–	MediumDebtRatio	56.94
Sweden	–	–	80–90; 00–19	34.00–58.39; 31x	91–99	60.07–68.68; 9x	–	–	–	–	MediumDebtRatio	48.83
United Kingdom	90–91	28.44–28.52; 2x	80–89; 92–08	42.59–49.03; 27x	44823.00	62.84–86.02; 11x	–	–	–	–	MediumDebtRatio	50.68
United States	80–91	2.91–29.23; 12x	92–03	31.62–58.63; 12x	44660.00	64.22–84.64; 6x	44853.00	95.20–108.80; 10x	–	–	MediumDebtRatio	54.83

Notes: Year Range: for e.g. 80–92 = 1980 to 1992; Debt Ratio Range: for e.g. 9.68–29.36 = debt ratio range for 1980 to 1992 and 1996 to 2012. Debt for the period ranged between 9.68% and 29.36%; Frequency: for e.g. 30x = the number of years debt ratio fell within the identified range. In other words, out of 40 years, Australia had low debt ratios for a total of 30 years.